Appendix A

| nop | IGNORE_OPCODE |
|-------------|---------------|
| aconst_null | OP_PUSHB |
| iconst_ml | OP_PUSHB |
| iconst_0 | OP_PUSHB |
| iconst_1 | OP_PUSHB |
| iconst_2 | OP_PUSHB |
| iconst_3 | OP_PUSHB |
| iconst_4 | OP_PUSHB |
| iconst_5 | OP_PUSHB |
| Iconst_0 | OP_PUSHL |
| lconst_1 | OP_PUSHL |
| fconst_0 | OP_PUSH |
| fconst_1 | OP_PUSH |
| fconst_2 | OP_PUSH |
| dconst_0 | OP_PUSHL |
| dconst_1 | OP_PUSHL |
| bipush | OP_PUSHB |
| sipush | OP_PUSH |
| ldc | OP_PUSH |
| ldc_w | OP_PUSH |
| ldc2_w | OP_PUSHL |
| iload | OP_LOAD |
| lload | OP_LOADL |
| fload | OP_LOAD |
| d1oad | OP_LOADL |
| aload | OP_LOAD |
| iload_0 | OP_LOAD |
| iload_1 | OP_LOAD |
| iload_2 | OP_LOAD |
| iload_3 | OP_LOAD |
| lload_0 | OP_LOADL |
| 11oad_1 | OP_LOADL |
| 11oad_2 | OP_LOADL |

| Iload_3 | OP_LOADL |
|----------|----------|
| fload_0 | OP_LOADL |
| fload_1 | OP_LOAD |
| fload_2 | OP_LOAD |
| fload_3 | OP_LOAD |
| dload_0 | OP_LOADL |
| d1oad_1 | OP_LOADL |
| dload_2 | OP_LOADL |
| dload_3 | OP_LOADL |
| aload_0 | OP_LOAD |
| aload_l | OP_LOAD |
| aload_2 | OP_LOAD |
| aload_3 | OP_LOAD |
| iaload | OP_ALOAD |
| laload | OP_ALOAD |
| faload | OP_ALOAD |
| daload | OP_ALOAD |
| aaload | OP_ALOAD |
| baload | OP_ALOAD |
| caload | OP_ALOAD |
| saload | OP_ALOAD |
| istore | OP_STOR |
| Istore | OP_STORL |
| fstore | OP_STOR |
| dstore | OP_STORL |
| astore | OP_STOR |
| istore_0 | OP_STOR |
| istore_1 | OP_STOR |
| istore_2 | OP_STOR |
| istore_3 | OP_STOR |
| 1store_0 | OP_STORL |
| 1store_1 | OP_STORL |
| Istore_2 | OP_STORL |
| 1store_3 | OP_STORL |
| fstore_0 | OP_STOR |
| fstore_1 | OP_STOR |

| fstore_2 | OP_STOR |
|----------|------------|
| fstore_3 | OP_STOR |
| | OP_STORL |
| dstore_0 | |
| dstore_1 | OP_STORL |
| dstore_2 | OP_STORL |
| dstore_3 | OP_STORL |
| astore_0 | OP_STOR |
| astore_1 | OP_STOR |
| astore_2 | OP_STOR |
| astore_3 | OP_STOR |
| iastore | OP_ASTORE |
| lastore | OP_ASTOREL |
| fastore | OP_ASTORE |
| dastore | OP_ASTOREL |
| aastore | OP_ASTORE |
| bastore | OP_ASTORE |
| castore | OP_ASTORE |
| sastore | OP_ASTORE |
| рор | OP_POP |
| pop2 | OP_POP |
| dup | OP_DUP |
| dup_x1 | OP_DUP |
| dup_x2 | OP_DUP |
| dup2 | OP_DUPL |
| dup2_x1 | OP_DUPL |
| dup2_x2 | OP_DUPL |
| swap | OP_SWAP |
| iadd | OP_IADD |
| ladd | OP_LADD |
| fadd | OP_FADD |
| dadd | OP_DADD |
| isub | OP_ISUB |
| Isub | OP_LSUB |
| fsub | OP_FSUB |
| dsub | OP_DSUB |
| imul | OP_IMUL |
| L | L |

| fmul OP_FMUL dmul OP_DMUL idiv OP_IDIV Idiv OP_LDIV fdiv OP_FDIV ddiv OP_DEDIV irem OP_DDIV irem OP_IREM Irem OP_IREM frem OP_FREM drem OP_DREM ineg OP_INEG Ineg OP_INEG dneg OP_INEG dneg OP_INEG dneg OP_INEG ishl OP_ISHL Ishl OP_ISHL Ishr OP_ISHR Ishr OP_ISHR Ishr OP_ISHR Ishr OP_IUSHR Iushr OP_IUSHR Iushr OP_IUSHR Iand OP_IAND | lmul | OP_LMUL |
|--|-------|---------------|
| idiv OP_IDIV Idiv OP_LDIV fdiv OP_FDIV ddiv OP_DDIV irem OP_IREM Irem OP_IREM frem OP_FREM drem OP_DREM ineg OP_INEG Ineg OP_INEG fneg OP_INEG dneg OP_INEG dneg OP_INEG ishl OP_ISHL Ishl OP_ISHL Ishl OP_ISHR Ishr OP_ISHR Ishr OP_ISHR Iushr OP_IUSHR Iushr OP_IUSHR Iand OP_IAND ior OP_IAND ior OP_IOR Ior OP_IOR Ixor OP_IOR Ixor OP_IXOR Ixor OP_IXOR Ixor OP_IXOR Ixor OP_IXOR Ixor OP_IXOR Ixor OP_IXOR | fmul | OP_FMUL |
| Idiv | dmul | OP_DMUL |
| fdiv OP_FDIV ddiv OP_DDIV irem OP_IREM Irem OP_LREM frem OP_FREM drem OP_DREM ineg OP_INEG Ineg OP_INEG fneg OP_INEG dneg OP_INEG ishl OP_ISHL Ishl OP_ISHL Ishr OP_ISHR Ishr OP_ISHR Iushr OP_IUSHR Iushr OP_IUSHR Iand OP_IAND Iand OP_IAND Ior OP_IOR Ior OP_IOR Ior OP_IOR Ixor OP_IXOR Ixor OP_IXOR Iinc OP_IINC I2I OP_I2L I2f IGNORE_OPCODE I2d OP_L2F 12d OP_L2D I2i IGNORE_OPCODE | idiv | OP_IDIV |
| Description | Idiv | OP_LDIV |
| Irem | fdiv | OP_FDIV |
| Irem | ddiv | OP_DDIV |
| frem OP_FREM drem OP_DREM ineg OP_INEG Ineg OP_LNEG fneg OP_ENEG dneg OP_DNEG ishl OP_ISHL Ishl OP_LSHL ishr OP_ISHR Ishr OP_ISHR Iushr OP_IUSHR Iushr OP_LUSHR iand OP_LAND Ior OP_IOR Ior OP_IOR Ixor OP_IXOR Ixor OP_IXOR Ixor OP_IXOR Ixor OP_IXOR Ixor OP_IIXOR Ixor OP_IIINC Ixor OP_II | irem | OP_IREM |
| drem | Irem | OP_LREM |
| ineg | frem | OP_FREM |
| Ineg | drem | OP_DREM |
| fneg | ineg | OP_INEG |
| dneg | Ineg | OP_LNEG |
| ishl OP_ISHL Ishr OP_ISHR Ishr OP_ISHR Ishr OP_IUSHR Iushr OP_IUSHR Iushr OP_IUSHR Iand OP_IAND Iand OP_IAND Ior OP_IOR Ior OP_IOR Ixor OP_IXOR Ixor OP_IXOR iinc OP_IINC i2l OP_IZL i2f IGNORE_OPCODE i2d OP_I2D 12i OP_L2F 12d OP_L2F 12d OP_L2D f2i IGNORE_OPCODE | fneg | OP_FNEG |
| Shl | dneg | OP_DNEG |
| ishr OP_ISHR lshr OP_LSHR iushr OP_IUSHR lushr OP_LUSHR iand OP_IAND land OP_LAND ior OP_IOR lor OP_LOR ixor OP_IXOR lxor OP_IXOR iinc OP_IINC i2l OP_I2L i2f IGNORE_OPCODE i2d OP_L2I 12i OP_L2F 12d OP_L2D 12f OP_L2D 12d OP_L2D 12d OP_L2D 12d OP_L2D 12d OP_L2D 12d OP_L2D | ishl | OP_ISHL |
| Ishr | Ishl | OP_LSHL |
| iushr OP_IUSHR lushr OP_LUSHR iand OP_IAND land OP_LAND ior OP_IOR lor OP_LOR ixor OP_IXOR lxor OP_IXOR iinc OP_INC i2l OP_IINC i2l OP_I2L i2f IGNORE_OPCODE i2d OP_L2I 12i OP_L2F 12d OP_L2D f2i IGNORE_OPCODE | ishr | OP_ISHR |
| lushr OP_LUSHR iand OP_IAND land OP_LAND ior OP_IOR lor OP_LOR ixor OP_IXOR lxor OP_IXOR iinc OP_IINC i2l OP_I2L i2f IGNORE_OPCODE i2d OP_L2D 12i OP_L2F 12d OP_L2F 12d OP_L2D f2i IGNORE_OPCODE | Ishr | OP_LSHR |
| iand OP_IAND land OP_LAND ior OP_IOR lor OP_LOR ixor OP_IXOR lxor OP_LXOR iinc OP_IINC i2l OP_I2L i2f IGNORE_OPCODE i2d OP_L2D 12i OP_L2F 12d OP_L2D f2i IGNORE_OPCODE | iushr | OP_IUSHR |
| land OP_LAND ior OP_IOR lor OP_LOR ixor OP_IXOR lxor OP_LXOR iinc OP_IINC i2l OP_I2L i2f IGNORE_OPCODE i2d OP_I2D 12i OP_L2I 12f OP_L2F 12d OP_L2D f2i IGNORE_OPCODE | lushr | OP_LUSHR |
| ior | iand | OP_IAND |
| lor OP_LOR ixor OP_IXOR lxor OP_LXOR iinc OP_IINC i2l OP_I2L i2f IGNORE_OPCODE i2d OP_I2D 12i OP_L2I 12f OP_L2F 12d OP_L2D f2i IGNORE_OPCODE | land | OP_LAND |
| ixor OP_IXOR Ixor OP_LXOR iinc OP_IINC i2l OP_I2L i2f IGNORE_OPCODE i2d OP_I2D 12i OP_L2I 12f OP_L2F 12d OP_L2D f2i IGNORE_OPCODE | ior | OP_IOR |
| Ixor | lor | OP_LOR |
| iinc OP_IINC i2l OP_I2L i2f IGNORE_OPCODE i2d OP_I2D 12i OP_L2I 12f OP_L2F 12d OP_L2D f2i IGNORE_OPCODE | ixor | OP_IXOR |
| i2l OP_I2L i2f IGNORE_OPCODE i2d OP_I2D 12i OP_L2I 12f OP_L2F 12d OP_L2D f2i IGNORE_OPCODE | Ixor | OP_LXOR |
| i2f IGNORE_OPCODE i2d OP_I2D 12i OP_L2I 12f OP_L2F 12d OP_L2D f2i IGNORE_OPCODE | iinc | OP_IINC |
| i2d OP_I2D 12i OP_L2I 12f OP_L2F 12d OP_L2D f2i IGNORE_OPCODE | i2I | OP_I2L |
| 12i OP_L2I 12f OP_L2F 12d OP_L2D f2i IGNORE_OPCODE | i2f | IGNORE_OPCODE |
| 12f OP_L2F 12d OP_L2D f2i IGNORE_OPCODE | i2d | OP_I2D |
| 12d OP_L2D f2i IGNORE_OPCODE | 12i | OP_L2I |
| f2i IGNORE_OPCODE | 12f | OP_L2F |
| | 12d | OP_L2D |
| f2I OP_F2L | f2i | IGNORE_OPCODE |
| | f2I | OP_F2L |

| f2d | OP_F2D |
|--------------|-------------------|
| d2i | OP_D2I |
| d2l | OP_D2L |
| d2f | OP_D2F |
| i2b | IGNORE_OPCODE |
| i2c | IGNORE_OPCODE |
| i2s | IGNORE_OPCODE |
| lcmp | OP_LSUB, OP_JMPEQ |
| fcmpl | OP_FSUB, OP_JMPLE |
| fcmpg | OP_FSUB, OP_JMPGE |
| dcmpl | OP_DCMP, OP_JMPLE |
| dcmpg | OP_DCMP, OP_JMPGE |
| ifeq | OP_JMPEQ |
| ifne | OP_JMPNE |
| ifIt | OP_JMPLT |
| ifge | OP_JMPGE |
| ifgt | OP_JMPGT |
| ifle | OP_JMPLE |
| if icmpeq | OP_ISUB, OP_JMPEQ |
| if icmpne | OP_ISUB, OP_JMPNE |
| if icmplt | OP_ISUB, OP_JMPLT |
| if icmpge | OP_ISUB, OP_JMPGE |
| if icmpgt | OP_ISUB, OP_JMPGT |
| if icmple | OP_ISUB, OP_JMPLE |
| if acmpeq | OP_ISUB, OP_JMPEQ |
| if acmpne | OP_ISUB, OP_JMPNE |
| goto | OP_JMP |
| jsr | OP_JSR |
| ret | OP_RET |
| tableswitch | OP_SWITCH |
| lookupswitch | OP_SWITCH |
| ireturn | OP_RETURN |
| Ireturn | OP_LRETURN |
| freturn | OP_RETURN |
| dreturn | OP_LRETURN |
| areturn | OP_RETURN |
| <u> </u> | |

| return | OP_RETURNV |
|-----------------|------------------|
| getstatic | OP_RESOLVE |
| putstatic | OP_RESOLVEP |
| getfield | OP_RESOLVE |
| putfield | OP_RESOLVEP |
| invokevirtual | OP_RESOLVE |
| invokespecial | OP_RESOLVE |
| invokestatic | OP_RESOLVE |
| invokeinterface | OP_RESOLVE |
| xxxunusedxxx | IGNORE_OPCODE |
| new | OP_NEW |
| newarray | OP_NEW |
| anewarray | OP_NEW |
| arraylength | OP_ARRAYLENGTH . |
| athrow | OP_THROW |
| checkcast | IGNORE_OPCODE |
| instanceof | OP_INSTANCEOF |
| monitorenter | OP_MUTEXINC |
| monitorexit | OP_MUTEXDEC |
| wide | OP_WIDE |
| multianewarray | OP_NEW |
| ifnull | OP_JMPEQ |
| ifnonnull | OP_JMPNE |
| goto_w | OP_JMP |
| jsr_w | OP_JSR |